Welcome to CSE 322: Intro. to Formal Models

✧ More popularly known as: Theory 101
✧ Instructor: Rajesh Rao (rao@cs.washington.edu)
✧ TAs:
  ✧ Ethan Phelps-Goodman (ethanpg@cs)
  ✧ Peter-Michael Osera (psosera@cs)
✧ Guest appearances:

Syllabus and Course Information

✧ Browse class web page for syllabus and course information:
✧ Lecture slides will be made available on the website
✧ Add yourself to the mailing list → see the web page
✧ Textbook
  ❧ Introduction to the Theory of Computation (1997)
  ❧ By Michael Sipser (at MIT)
Today’s Agenda

✦ Course Topics
✦ Course Goals
✦ How do I get an A? Homework, exams, etc…
✦ Review of Selected Topics from Chapter 0
  ➔ Sets and Mathematical Notation
  ➔ Functions and Relations
  ➔ Strings and Languages

Course Topics

✦ Mathematical Preliminaries (Chap. 0)
✦ Regular Languages and Finite Automata (Chap. 1)
✦ Context-Free Languages and Pushdown Automata (Chap. 2)
✦ Turing Machines and the Church-Turing Thesis (Chap. 3)
✦ Decidable and Undecidable Languages (Chap. 4)
✦ Selected topics from Chap. 5
Course Goals

✦ General Goals:
  ➔ Learn to mathematically express and analyze a problem or statement about computation
  ➔ Learn to prove mathematical theorems about computation
  ➔ Hone your analytical skills for your future career!

Course Goals

✦ Specific Goals:
  ➔ Understand how problems can be classified as computationally “easy” or “hard” using abstract computational “machines”
  ➔ Learn about regular expressions, finite automata, context-free grammars, and Turing Machines
  ➔ Discover their applications in string searching, compilers, hardware design, programming languages, and algorithmic analysis
How do I get an A in this class?

✦ Answer: Practice, Practice, Practice (solving problems)

✦ Weekly homework assignments (50%)
  ➢ Total of about 7 assignments
  ➢ Collaborative/group work is encouraged but only after you have tried to solve each problem by yourself first
  ➢ No copying of solutions – explain in your own words!!
  ➢ See Course Policies regarding this on the Web
  ➢ No late submissions: due at the beginning of class on due date

✦ Midterm exam (20%)
  ➢ Wednesday, November 3, 2004 (in class during regular class time)

✦ Final exam (30%)
  ➢ Mon, December 13, 2004 from 2:30-4:20 p.m. (in same classroom)

Okay, time to wake up…
Let’s begin with some basics…

✦ Review of things you probably already know:
  • Sets and mathematical notation
  • Functions
  • Relations
  • Strings
  • Languages

Next Class: Strings and Languages…

✦ Things to do:
  • Visit course website
  • Sign up for mailing list (instructions on website)
  • Read Chapter 0